Amendments to the Claims:

The following listing of the claims replaces and supersedes all previous listings.

1-32. (Cancelled)

33. (Currently Amended) A microfluidic reaction support comprising a flow channel structure for directing fluids for the synthesis of oligomers or polymers, said flow channel structure comprising:

fluid feed channels for feeding fluid to reaction areas, each of said fluid feed channels having a non-uniform cross-section for influencing the flow of said fluid;

fluid discharge channels for discharging fluid from the reaction areas, each of said fluid discharge channels having a non-uniform cross-section for influencing the flow of said fluid; and

reaction areas formed by connecting channels which connect the fluid feed channels with fluid discharge channels, said connecting channels being arranged in a side-by-side relationship and at an <u>obtuse</u> angle to said fluid feed channels and <u>to said</u> fluid discharge channels <u>measured in a direction of fluid flow</u> such that fluid can be discharged from each reaction area with circumvention of the particular other reaction areas (4; 104).

34. (Previously Presented) The microfluidic reaction support as claimed in claim 33,

wherein each of said fluid feed channels has a tapered cross-section from an input and to a discharge end, and each of said fluid discharge channels is tapered from an input end to a discharge end.

35. (Previously Presented) The microfluidic reaction support as claimed in claim 33, wherein each of said connecting channels has a non-uniform cross-section for influencing fluid flow.

36. (Previously Presented) The microfluidic reaction support as claimed in claim 33, wherein the fluid feed channels run essentially parallel to one another and are disposed in a first level of the microfluidic reaction support, the fluid discharge channels are disposed in a second level of the microfluidic reaction support, and the connecting channels with the reaction areas (104) are located perpendicular or nearly perpendicular to said levels.

37. (Previously Presented) The microfluidic reaction support as claimed in claim 33, wherein the fluid feed channels cross the fluid discharge channels at an angle in a projection perpendicular to the first and second level.

38. (Previously Presented) The microfluidic reaction support as claimed in claim 33, further comprising a valve system for individually charging or discharging each flow channel.

39. (Previously Presented) The microfluidic reaction support as claimed in claim 33, wherein the flow channel structure is provided on one side or on both sides with a transparent cover layer.

40. (Previously Presented) The microfluidic reaction support as claimed in claim 39, wherein the flow channel structure is provided on both sides with a transparent cover layer, in which the transparent cover layers comprises a glass or plastic and a structure of microlenses is integrated into said cover layers such that the incident light is focused on the reaction areas and the reflected light of a detection reaction is concentrated accordingly.

41. (Previously Presented) The microfluidic reaction support as claimed in claim 39, in which the transparent cover layers comprises a multiplicity of parallel fused glass fibers which form a transparent honeycomb structure such that the incident light and the reflected light are parallelized and the light is prevented from spreading sideways, due to reflection, in the cover layer.

42. (Previously Presented) The microfluidic reaction support as claimed in claim 33, wherein the walls between the feed channels and the discharge channels comprise lightproof material.

43. (Previously Presented) The microfluidic reaction support as claimed in claim 36, wherein the connecting channels (104; 204) comprise a plurality of glass fiber bundles fused together from which the glass fiber cores have been etched out to form microchannels.

44. (Previously Presented) The microfluidic reaction support as claimed in claim 43, wherein plurality of glass fiber bundles is arranged in the area of the reaction area.

45. (Previously Presented) The microfluidic reaction support as claimed in claim 36, wherein the first and second levels of the microfluidic reaction support each comprise a silicon layer into which a multiplicity of small channels has been etched.

46. (Previously Presented) The microfluidic reaction support as claimed in claim 36, wherein a plurality of levels with flow channels are arranged on top of one another such that the reaction areas in the projection perpendicular to the flow levels are not superimposed and can be photoactivated individually by light and light can be detected, likewise location-specifically, for each of the reaction areas.

47. (Previously Presented) The microfluidic reaction support as claimed in claim 33, further comprising an integrated programmable light source matrix.

48. (Previously Presented) The microfluidic reaction support as claimed in claim 33, further comprising an integrated detection unit in the form of a CCD matrix integrated.

49. (Previously Presented) The microfluidic reaction support as claimed in claim 33, wherein a plurality of in different receptors is each bound to selected areas in the support.

50. (Previously Presented) The microfluidic reaction support as claimed in claim 49, wherein the receptors are selected from the group consisting of nucleic acids and nucleic acid analogs.

51. (Previously Presented) The microfluidic reaction support as claimed in claim 49, wherein the receptors are synthesized on the support from individual synthesis building blocks.

52. (Previously Presented) The microfluidic reaction support as claimed in claim 49, wherein a building block is provided between receptor and support, which allows the receptor to be removed by cleavage.

53. (Previously Presented) A method of using a microfluidic reaction support, comprising steps of:

providing the microfluidic reaction support as claimed in claim 33;

performing synthesis of oligomers or polymers with said microfluidic reaction support.

54. (Previously Presented) The method as recited in claim 53, wherein said performing step comprises wet-chemical synthesis of oligomeric or polymeric probes from a list consisting of DNA, RNA, PNA, and LNA.

55. (Previously Presented) The method as recited in claim 53, wherein said performing step comprises integrated synthesis and analysis of polymers.

56. (Previously Presented) The method as recited in claim 53, wherein said performing step comprises optical analysis of hybridization of synthesized polymeric probes with complementary fragments.

57. (Previously Presented) The method as recited in claim 53, wherein said performing step comprises efficient highly parallel combined wet-chemical and light-controlled synthesis of oligomeric or polymeric probes; and

subsequent optical analysis of the hybridization with complementary fragments.

58. (Previously Presented) The method as recited in claim 53, wherein said performing step comprises light-controlled synthesis of oligomeric or polymeric probes; and

subsequent optical analysis of the hybridization with complementary fragments

59. (Previously Presented) A method of using a microfluidic reaction support, comprising steps of:

providing the microfluidic reaction support as claimed in claim 39; and

measuring luminescence and fluorescence through the transparent cover layer in a backlight process.

60. (Previously Presented) A method of using a microfluidic reaction support, comprising steps of:

providing the microfluidic reaction support as claimed in claim 39;

exposing each reaction area to light of a defined wavelength via a programmable light source matrix, wherein each reaction is biochemically functionalized via the light and the supply of fluid; and

optically monitoring all processes in the reaction support simultaneously via the second transparent cover layer.

61. (Previously Presented) A method of using a microfluidic reaction support, comprising steps of:

providing the microfluidic reaction support as claimed in claim 39; and

measuring luminescence, fluorescence and absorption through the two transparent cover layers in a transmitted-light process.